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NUTRITION IN RELATION TO  
FARM INCOME, HOME-PRODUCTION, AND LAND USE /1

By  
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Appraisal of Farm Family Diets

According to our studies at the Bureau of Home Economics, farm families as a whole appear to be the best fed population group in this country--and village families, the poorest. The diets of 60 percent of the farm families we have studied met or exceeded average minimum requirements in every nutrient. (See chart, Diet Rating and Income, p. 3) Only 40 percent of the village families fared as well, and in some sections of the country only 40 percent of city families.

Gratifying though it is to know that farm families have the lowest proportion of poor diets of any population group, we must remember that 40 percent of the farm families studied had diets that failed in one or more respects to meet average minimum requirements, and hence those families are handicapped for vigorous living. We cannot be satisfied until 100 percent of farm families have diets that can be rated fair or good.

It may help us solve the problem to ask how it happens that farm families fare better than village families in the proportion of diets that can be graded good or fair.

Are they more prosperous? There is a common impression abroad that if incomes are high enough, the nutrition problem will take care of itself. According to the National Resources Committee, the median income of nonrelief farm families in 1935-36 was \$965; of village families, \$1,210. Income itself, then, does not account for the difference. This is borne out also by the chart (p.3) which shows that among farm families at least, the quality of diet from the nutritive standpoint has no close relation to income.

Is the better dietary situation among farm families the result of more informed food choices? There has been a quarter of a century of Extension Service. Undoubtedly this has contributed richly both in disseminating knowledge of foods and nutrition and in helping families to increase their incomes in money and in kind.

/1 Presented March 3, 1939, at the Regional Extension Conference for Northeastern States, New York, N. Y.

And is the difference in part due to a rather natural result of the way of living? In the course of production for market, many farm families obtain without direct expense, and hence use more of milk, eggs, fruits, vegetables, and meats--foods that take a large share of the city family's food dollar.

Perhaps it would be well to ask, before going further, wherein diets rated poor differ from those graded fair or good. A diet was classed poor if it failed to provide per man-unit per day these quantities:

45 gm. protein
0.44 gm. calcium
10 mg. iron
3,000 international units, vitamin A
250 international units, vitamin B
37 mg. ascorbic acid

This list covers but a few of the essential nutrients, but includes ones that are frequently inadequately supplied. The nutritionists will recognize that these specifications form a very modest measuring rod indeed. Often a diet was short in just one nutrient. It was classed as poor nevertheless, because in building sturdy bodies, and in keeping them fit, the required amount of each single essential nutrient is just as important as that of any other.

For example, good tooth structure requires among other things, plenty of calcium, plenty of phosphorus, plenty of vitamin A, plenty of vitamin C, and plenty of vitamin D. Sometimes teeth are poor for lack of one nutrient, sometimes of another. If the minimum amount of any one of these is lacking, there is trouble.

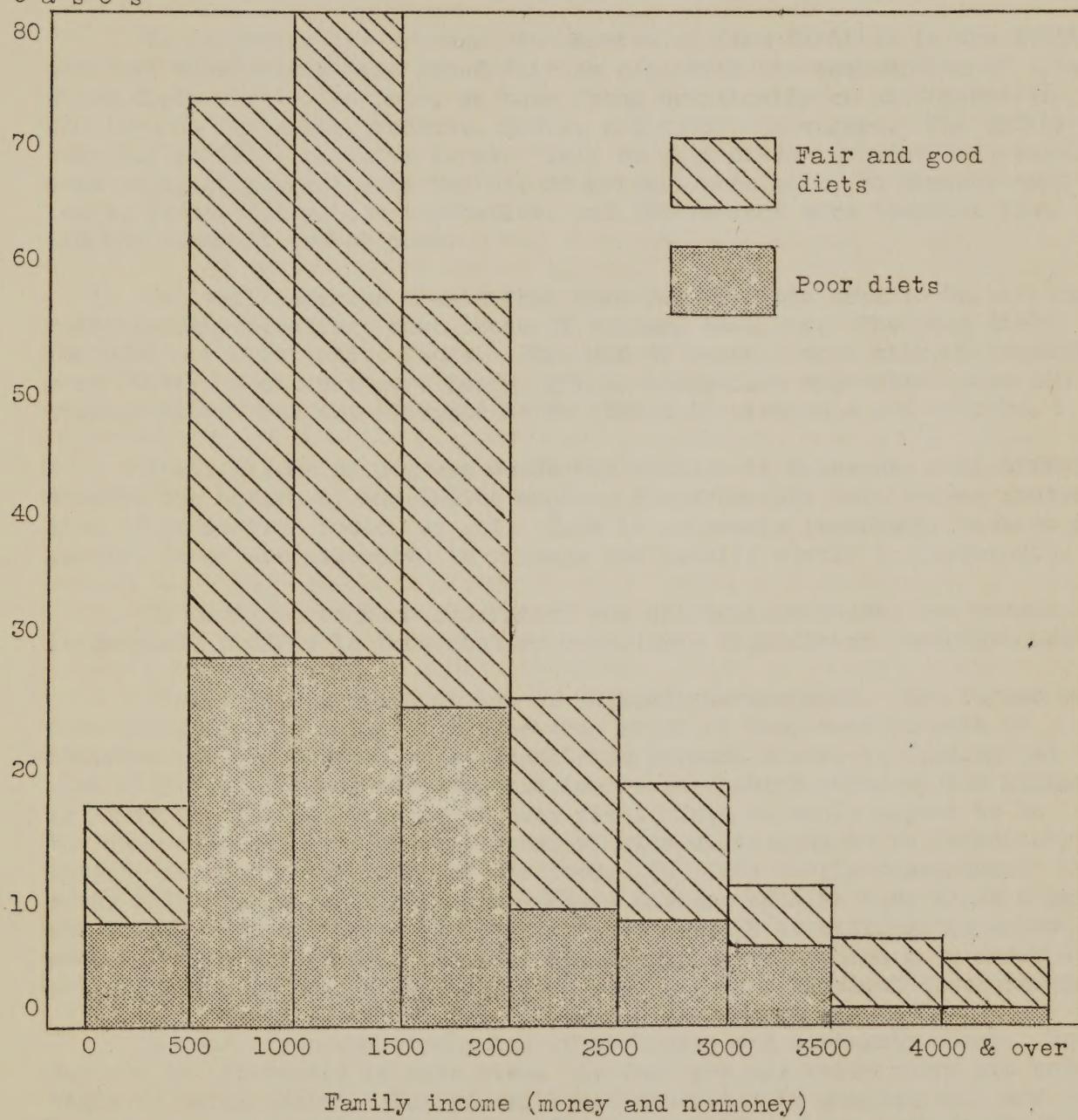
Indices of health depend on so many factors that results of research sometimes appear to be contradictory. In research we are often much like the blind men describing the elephant. The experience of one led him to describe the elephant as a tree because he had observed its leg; another, as a wall because he had examined the side; another, as a rope because he had "met up" with the tail. Thus, in the case of tooth nutrition, one investigator may conclude that vitamin D is the most important dietary factor; another, milk, with its high calcium and phosphorus content; another, fruit juices, rich in vitamin C. Conclusions depend on the conditions of the investigation. But practically all investigators agree that a well-balanced regime including plenty of sunshine or fish liver oils, and a diet for a person a day, including a quart of milk, an egg, a glassful of orange juice--but not too much sugar--is a pretty sure prescription for good tooth structure, insofar as it is a nutrition problem.

And so in our diet ratings, we insist that the diet shall provide at least a minimum of each nutritional essential if it is to be graded fair or good.

# DIET RATING AND INCOME

FARM FAMILIES, NORTH AND WEST

(Nonrelief families, including husband and wife,  
both native born)

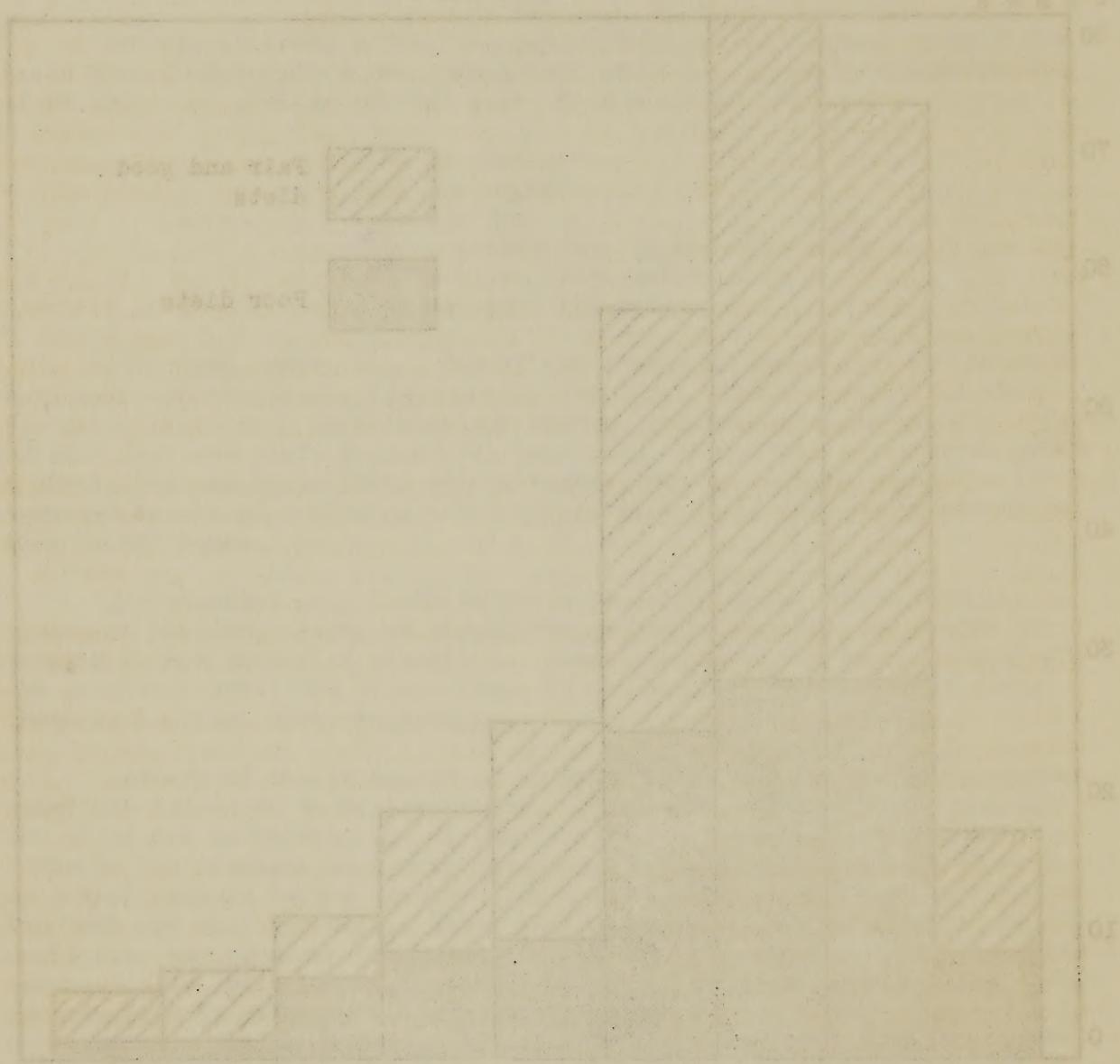


Preliminary figures, Consumer Purchases Study, Bureau of Home Economics

# DIET RATING AND INCOME

1950 TENTATIVE, MARKED

1950 INCOME, MARKED



1950 INCOME, MARKED 1950 TENTATIVE

1950 INCOME, MARKED 1950 TENTATIVE

In examining the diet records, wherein are diets most likely to be weak? As we see it, among farm families the country over, the deficiency is liable to be in vitamin A, calcium, and in vitamin C, which, being interpreted--as any nutritionist will tell you--means dairy products, eggs, vegetables, and fruits.

In comparing the average consumption of farm families in the North and West whose diets were rated fair or good with the consumption of those whose diets were rated poor, we have found practically no difference in the figures for grain products, meats, potatoes, and sugars. The difference lay in the protective foods. Fair or good diets included 25 percent more eggs, 25 percent more butter, 34 percent more milk, 55 percent more leafy, green, and yellow vegetables, and 220 percent more tomatoes than did the diets listed as poor.

You will remember I said that farm-family diets seem to be better, nutritionally speaking, than those of village families. The farm diets included more protective foods. They had 40 percent more milk, 5 percent more butter, 7 percent more leafy, green, and yellow vegetables than did village diets, and hence tended to be richer in vitamin A and calcium.

Perhaps some of you are wondering whether it makes any real difference to the health of the Nation whether diets include this larger proportion of protective foods, or not. This is extremely important, because protective foods are expensive to produce and usually costly to distribute.

In addition to much laboratory and clinical evidence, two recent large-scale studies in this country contribute significant observations:

First, from the standpoint of physical development. The Bureau of Home Economics, in making a Nation-wide study of body measurements of children for the purpose of standardizing garment sizes, is finding (a) that children of the lower economic levels lag behind those of the higher in every significant measure of body size. This we would expect to be the case from our city dietary studies; city diets tend to be definitely better, as more money is spent for food. (b) This bodily-measurement study indicates also that in areas where dietary studies have shown a preponderance of poor diets, the physical development of children is below average. And vice versa, in those areas where diet studies have shown a preponderance of good diets, children have superior physical development.

Second, from the standpoint of morbidity and mortality rates. You may not be interested in mere size. In fact you may think there are advantages in being petite. But you will be interested in keeping well and prolonging the span of healthy life. So these two facts are arresting: (a) Public health service studies show that morbidity and mortality rates go from low to high in the following order, by degree of urbanization: Farm, large city, middle-sized city, small city, village. (b) This order parallels the ascending order in which we would place these communities by the proportion of diets graded poor.

It would seem, then, that good diets are an asset of farm families that should be preserved and enhanced. Good diets are essential not only for the aesthetic and social values they have, but from a health standpoint also.

#### Home-Production Programs and Land Use

The first chart (p.3) shows that there is no close correlation between income and quality of diet among farm families. Undoubtedly this may be attributed to the fact that part of farm income usually consists of farm-furnished food, and hence even at low economic levels families may succeed in obtaining a goodly quantity of protective foods.

Living in a money economy, farm families are interested, of course, and rightly so, in obtaining as large a money income as possible. But this does not necessarily mean money income to the exclusion of income in kind. On most farms much of the production of food for family consumption is related to, or incidental to, commercial production. Thus in dairy country, like northwestern Vermont, southeastern Wisconsin, or western Washington, both the proportion of farm families having milk for home use and the average quantity consumed per family is relatively high. And in these sections production of potatoes for family use as well as many kinds of garden produce seems to be accepted practice. Egg and/or meat production for home use appears to be limited, however.

In grain-producing areas, such as Iowa, Illinois, and North Dakota, supplies of meat and eggs retained or produced for family consumption are considerably above average, but gardens and orchards tend to be small or rather unproductive. In highly-specialized areas of truck-vegetable and fruit-growing, where farms are small, the family generally has at its disposal plenty of these plant products, but relatively little of animal products. As a rule, the latter require considerable land for their production, as well as a fairly large capital and labor investment.

And so, though we all know families and localities where home consumption is low while commercial production is emphasized, this is not generally the case. Many low-income families hesitate to withhold from the market any product that will add to its cash income--but most farm families prefer to have generous home supplies of the foods that can be economically farm-produced. Selling these at the farm price and buying similar products or others at retail price is a poor bargain. The family kitchen is a profitable market for farm produce and a steady one.

Although much farm-furnished food is produced incidentally to production for sale, on many farms it has been found profitable to produce more or less food expressly for family consumption. The motive behind this special production varies. It may be:

1. Because it is cheaper. This must be decided on the basis of cost accounting, with due regard to available labor and the possible alternate use of time, land, and capital.

2. Because it involves less cash outlay at a time when cash is more important than time, and when opportunities for increasing cash income are few. It may be no cheaper to produce certain foods than to buy them counting all costs, yet the farm set-up may be such that they can be farm-furnished with little direct cash outlay through utilization of resources otherwise partly wasted. As a result of such production, cash expenditures for food can be lessened and cash released for other living expenditures, or for getting ahead financially.

3. To insure dietary adequacy. Sometimes needed products are not available for purchase at any price. At times competition of other goods is such that adequate diets might not be purchased even though money incomes were much increased.

4. Because of interest in production of high-quality products, not available at any price or at a price that can be afforded. I have lived on a farm enough to know that crops yield culls as well as perfect specimens, but I also understand food enough to know that, other things being equal, certain advantages in flavor and nutritive value come from being at the site of production rather than 5,000 miles away. (I do not wish to be misunderstood. Our food industries have made remarkable progress in wiping out distance and season on city markets, and they have learned much about conserving flavor and food values during storage, processing, and in transit.)

Families and communities often ask whether to press for an expansion of or a reduction in home food production programs. I am sure that you do not have ready-made answers to such questions any more than we at the Bureau of Home Economics are willing to provide ready-made budgets for a family of given size or income. Altogether too much depends on the circumstances. The family alone knows what it is willing to sacrifice in order to gain some other good. Our job, it seems to me, is to give suggestions as to how families or communities can work out their own budgets, to give them as much as we can of the factual data they need for decisions, and to help them think through their problems.

The great argument for commercial farming is that each region is generally more efficient than many others in the production of certain commodities. Hence the farmer would do well to raise these commodities for the market, and from the proceeds, to purchase the other products needed to feed his family from those regions where soil, climate, and the labor situation are better adapted to their production.

Some of you work with groups of families specializing in milk production; others, in meat production; others, in fruit or vegetable production; still others, in egg production. Farmers as producers covet as a market not only the table of city families but the table of other farm families, as well. But farmers as consumers must inquire whether the difference in efficiency of production in different areas is great enough to do more than offset the charges of transportation, processing, and other middlemen's services, and whether the economic system is stable enough that successful production

of goods or services on one farm or in one part of the country is likely to enable the family to buy the products and services it does not produce but which are needed for well-rounded living.

If a farm is really an egg factory, or fruit factory, or cotton factory, if every inch of land and every bit of labor is intensively and effectively marshalled for production, and if there is a remunerative outlet for the products, it may be that the best use of land, and of human and other resources is in the production of this one crop.

But it is important to make sure that this is the case. One test is to determine whether the diversion of enough labor, capital, management, and land to provide a family garden or a poultry flock, or a cow, or a pig would cut into net cash returns to an amount exceeding the replacement value of garden produce, or the milk, or the eggs, or the meat.

Even granting that it might cost more to produce food, for example, to keep a cow than to buy in the cheapest possible form the minimum amount of milk required for an adequate diet, we must still ask whether the more-than-minimum that might be available through home production is important enough in raising levels of living--in increasing dietary adequacy--to do more than compensate for a possible reduction in net cash income. The answer will depend of course on many factors, chiefly, perhaps, on the economic status of the family and its standards of living.

And so when the problem of land use arises--what commodities shall be produced, what sold, and what retained for family use, or what shall be produced expressly for home consumption and who shall produce them, I think that the whole family should be called together to consider a plan for action. There will be need for all the facts--the outlook for prices of commodities bought and products sold; the resources of labor, capital, and management; probable income in cash and in kind, and a comparison of these with human needs for desirable planes of living.

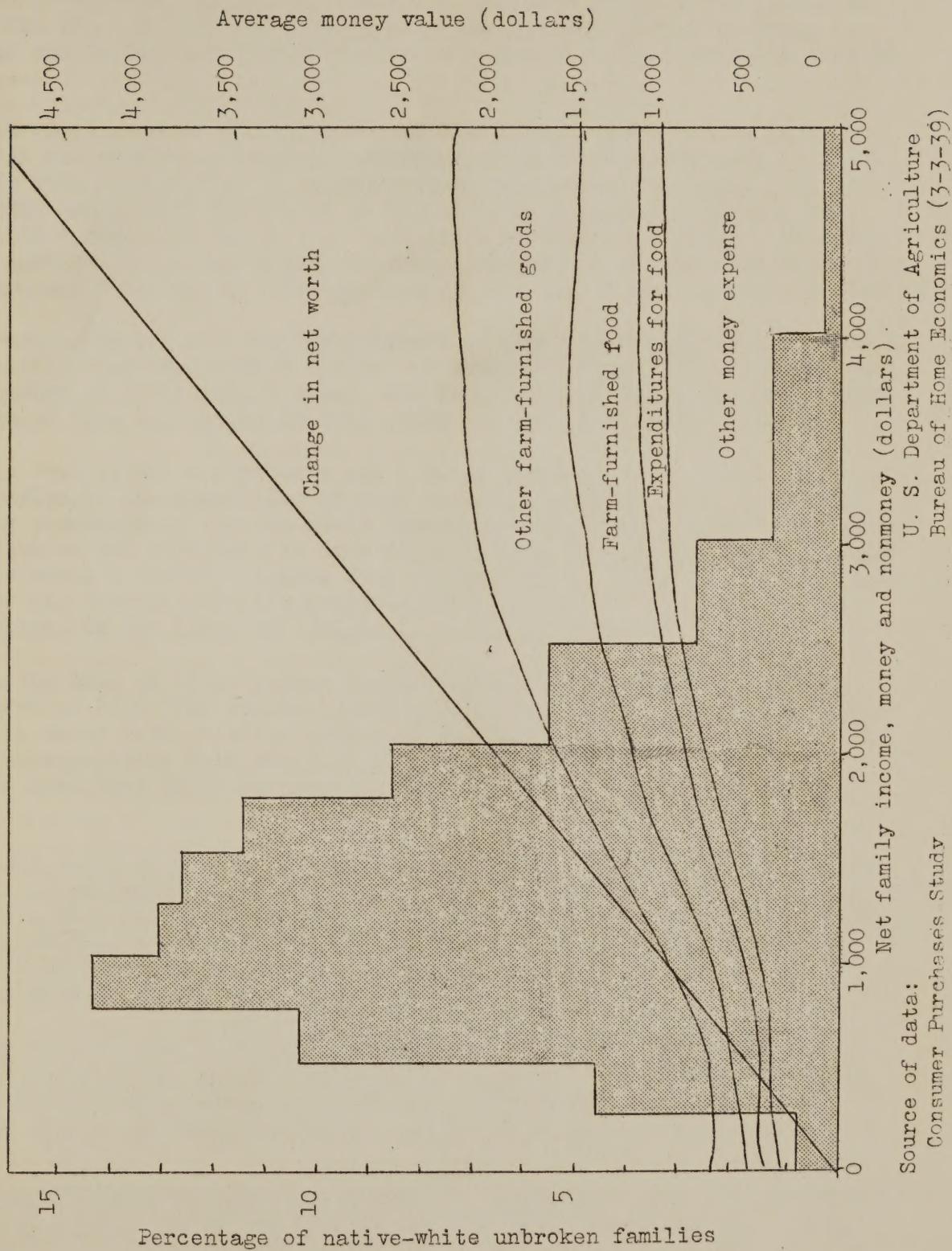
Sometimes in family financial planning it is useful to see how others in a somewhat similar economic situation have managed. This does not imply that one should follow another's design for living. There may be excellent reasons for developing a distinctly different pattern. But at least we should know that we are different and why.

The four charts appearing on pages 8, 11, 12, and 13 give figures on income, home-production, and dietary adequacy from families living in Lancaster County, Pa., and in Richland, Crawford, and Knox Counties, Ohio.

The chart "Distribution of families by income and allocation of income to change in net worth, farm-furnished goods, and expenditures for living" (p. 8) really consists of two charts, one superimposed upon the other. In this and two others (pp. 12-13) the main facts that the chart is intended to bring out are shown against a shadowy background of income distribution. This procedure enables one to see at a glance, the proportion of the population group to which any given section of a chart applies.

DISTRIBUTION OF FAMILIES BY INCOME, AND ALLOCATION OF INCOME TO CHANGE IN NET WORTH  
FARM-FURNISHED GOODS, AND EXPENDITURES FOR LIVING

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Although Lancaster County was fairly well-to-do, the Ohio counties weren't so prosperous. Combined, the distribution of families by income is between that found in the areas covered in the Consumer Purchases Study in New Jersey and in Vermont; New Jersey incomes tended to be higher and Vermont lower.

The chart shows that within a single community there can be wide differences in the economic status of individual families--differences as great or greater than differences in averages from one part of the country to another. This means that there must be flexibility in dietary programs and goals within a community as well as from one community to another. The Farm Security Administration has issued several permutations of our four basic diet plans (Farmers' Bulletin No. 1757)/2 to help care for these varying situations.

Average figures for the Pennsylvania and Ohio communities where farming is diversified show that almost 2/3 of the money value of the food supply was farm furnished at every income level, and more than 2/3 of the volume, since home-produced food was valued in this study at less than retail prices.

But even within a community and a given economic class there may be a wide variation in the quantities of food produced expressly for or retained for family consumption. As the chart "Home-produced food" (p.11) shows, money expenditures for food tend to drop steadily with increasing volume of home production until a certain minimum food expenditure is reached. This minimum represents the expenditures for articles which cannot be furnished by the farm or which, in the families' judgment, it does not pay to produce.

In the case of three-person Pennsylvania-Ohio families with living expenditures of \$500-\$749 during 1935-36, this minimum for food expenditures amounted to about \$150, however much food the farm furnished. On the other hand, by extrapolating from the data at hand, it would appear that about \$265 would have been about the maximum spent for food had none been home-produced.

There was a difference of \$115 between this estimated maximum expenditure and the average minimum food expenditure of families of this economic group. This \$115 is not clear gain, of course, because cash as well as time and energy must be spent to carry on food production for family use. But with \$500-\$750 (an average of \$630) for all living expenses, it makes a difference whether \$265 or only \$150 must be spent for food.

Nor is the chief benefit of a good program of food production for family use to be found in its "cash-sparing" action. The health-conserving values of nutritionally adequate diets probably are even more important. The volume of food produced for family use tends to be increased more

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12 Carpenter, Rowena Schmidt, and Stiebeling, Hazel K. Diets to fit the family income. U. S. Dept. Agr. Farmers' Bull. 1757. 38 pp., illus. 1936.

rapidly than the reduction in the amount spent for food. Hence the chances that a family will get a satisfactory diet increase rapidly as the program of food production is enlarged and geared to family needs. Whereas it is estimated that scarcely 2 out of 10 of the three-person families in this area would have succeeded in obtaining even a fair diet, nutritionally speaking, when as little as \$265 was spent for food, with none farm-furnished, perhaps as many as 7 out of 10 obtained fair or good diets when they supplemented purchased food with \$150 to \$250 worth of farm-furnished food. About 9 families out of 10 probably had fair or good diets when the purchased food (\$150 worth) was supplemented by \$350 worth and more of home-produced food.

Home-production programs tend to improve diets because they make possible increased consumption of eggs, milk, and green-colored vegetables--foods so important for their mineral elements and vitamins that they are called "protective foods." By gearing production for home use closely to the nutritional needs of the family, adjustments can be made which will give good diets at several levels of cost. There is no one pattern. Though these Pennsylvania-Ohio families did very well with their home-production programs there was still much room for improvement.

Generous home-food-production programs also add an incentive to canning and storage and hence contribute to important improvement in diets the year around.

Is production for home use an ideology belonging to horse and buggy days? If land were wisely used for commercial production, would incomes be high enough that farm families would no longer have to plan their food supply months or even a year ahead of time, but, like city families, could buy their food from week to week or day to day?

(p.12)

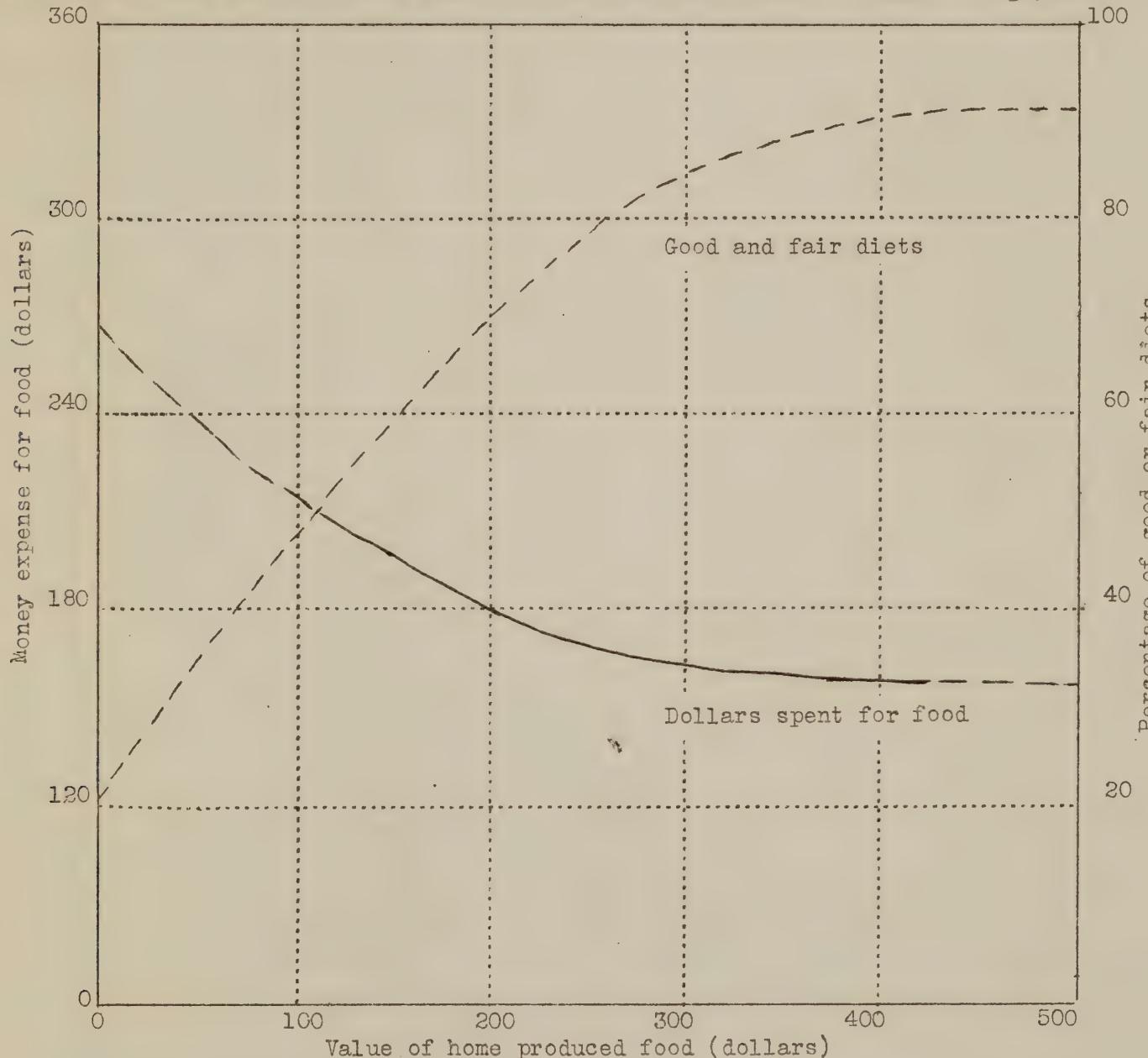
Let us look at a chart showing the net money incomes and living expenses of a group of nonrelief Pennsylvania-Ohio farm families. Although money incomes for the year 1935-36 varied widely, with about 8 percent having less than \$250, and another 9 percent, \$2,000 or more, the representative middle half had between \$500 and \$1,000 net money income. Living expenses went on even when net cash incomes were short; it was only when cash income amounted to about \$500, that average income began to exceed outgo. It would have been impossible to live on so little cash had families not had some income in kind: a good deal of food, fuel, and housing were furnished by the farm. About one in four of these families had less than \$500 cash income, and their average outlay exceeded income; about three out of four had more than \$500 net cash income and were able to get ahead financially as well as to spend gradually increasing amounts for living.

Now suppose these families had put all their efforts into a cash crop and had produced no food at home, not even a garden. How would they have fared? No one can say, of course, by how much they would have been able to increase their cash income had they concentrated on a cash crop. For the sake of a figure I have "supposed" that it might be about as much as the value they assigned to their farm-furnished food (a figure based

# HOME-PRODUCED FOOD

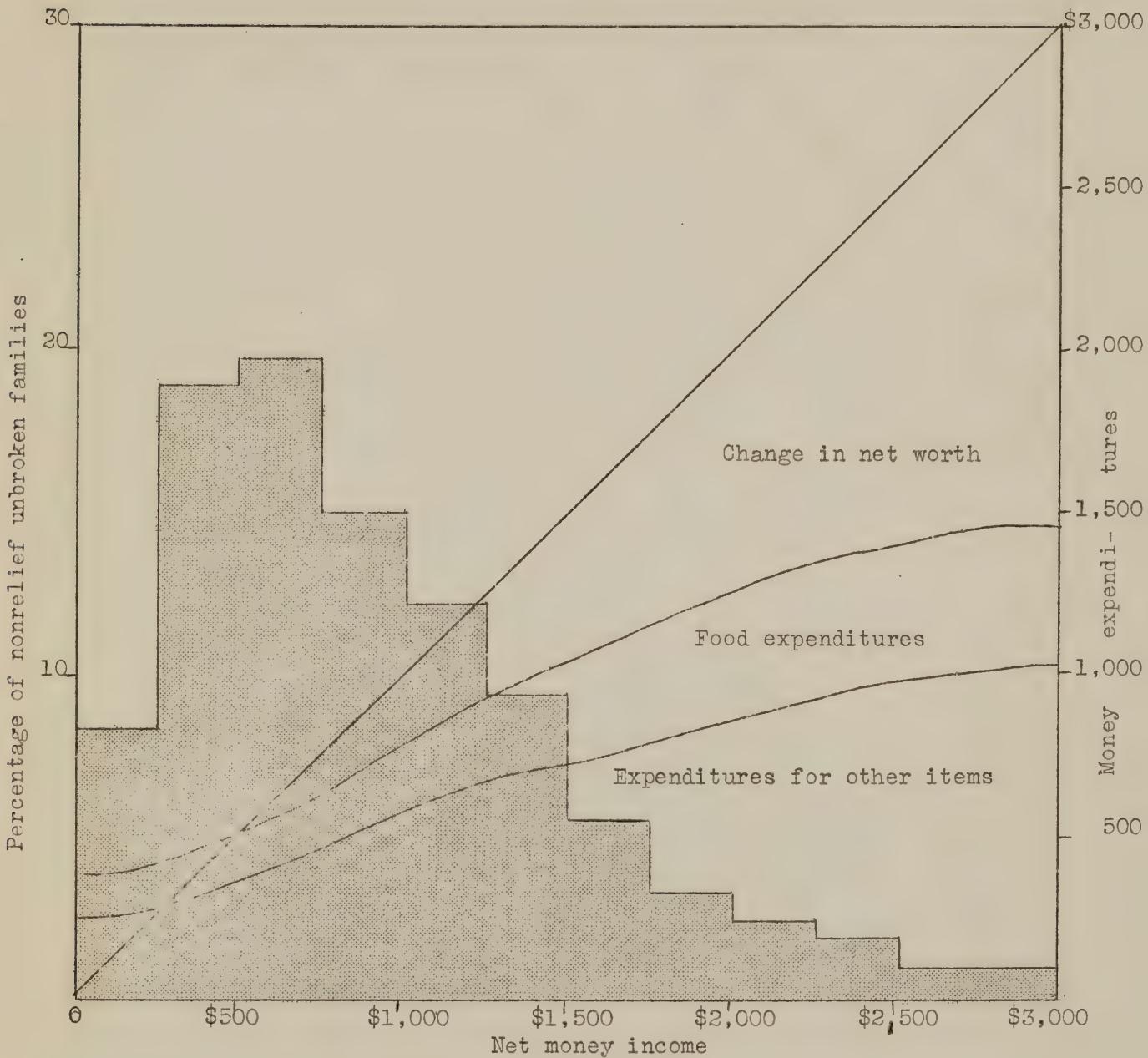
RELATION OF MONEY EXPENDITURE FOR FOOD TO VALUE OF HOME-PRODUCED  
FOOD FOR THE EXPENDITURE LEVEL \$500-749

84 Pennsylvania and Ohio Farm Families With One Child Under 16 Years of Age, 1935-36





DISTRIBUTION OF FARM FAMILIES BY NET MONEY INCOME, AND ALLOCATION  
TO CHANGE IN NET WORTH, AND EXPENDITURES FOR FOOD AND OTHER LIVING

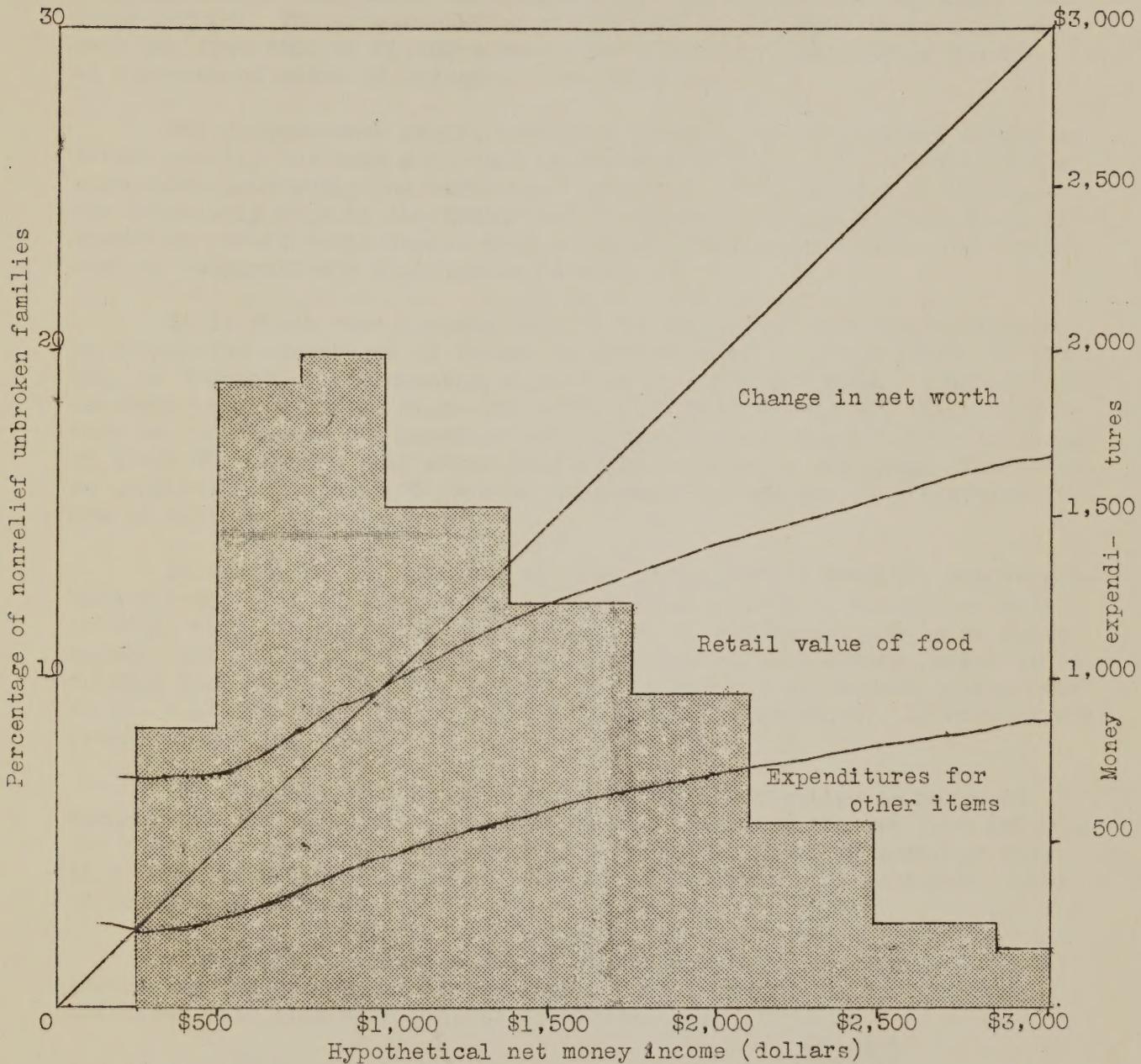


Source of data:  
Consumer Purchases Study

U. S. Department of Agriculture  
Bureau of Home Economics  
3-3-39



HYPOTHETICAL MONEY INCOME (NO HOME-PRODUCTION), CHANGE IN NET WORTH,  
RETAIL VALUE OF ALL FOOD, AND OTHER EXPENDITURES FOR LIVING



Source of data:  
Consumer Purchases Study

U. S. Department of Agriculture  
Bureau of Home Economics  
3-3-39



not on farm prices, but on those they probably would have paid neighbors had they purchased from neighbors similar qualities and quantities of food). This "supposition" increases cash income considerably--from approximately \$250 for the lower economic groups, up to \$375 for the upper economic groups. The representative middle half of families would then have had, not from \$500 to \$1,250 a year, but a hypothetical \$750 to \$1,750--an increase of about 50 percent. (See p. 13.)

Now suppose each family continued to live just as before; bought at retail exactly the same goods and services as before, but in addition the food which previously had been farm furnished. Food prices, as you know, are relatively high in the industrial Northeast. Customary farm diets if bought at retail would demand half or more of the expenditures for living, even at comparatively high income levels.

It is clear that incomes have to be increased very greatly indeed to forego the advantages of income in kind without lowering levels of living, or decreasing the chances of getting ahead financially. A 50-percent increase in cash income might not suffice. While buying all their food as well as other goods and services with a hypothetical money income increase of about 50 percent, only about half would be able to get ahead financially, as compared with almost 75 percent when emphasis was put on production for use as well as for sale.

In addition, the question at once arises, would families maintain so high a level of food expenditure if they lived solely in a money economy or would they, impressed by food costs, try to economize, and in so doing reduce their changes for good diets? There would be a strong incentive to cutting food costs. Selling produce at the buyer's price, and buying food at the seller's price puts one at an economic disadvantage. It hinders the family in getting ahead.

The ultimate test of production is the contribution it makes to human welfare. Agriculture has the task of providing the raw food material for feeding the nation. It contributes toward the goal of superior nutrition when it supplies the market throughout the year with essential foods at reasonable prices.

Conservative estimates of the increase in national consumption of protective foods needed to bring families with diets that are grossly deficient into line with present standards, are:

	Percent
Milk.....	15 to 30
Butter.....	10 to 15
Tomatoes, citrus fruit.....	12 to 75
Leafy, green, yellow vegetables.....	90 to 110

These facts as well as farmers' incomes must help to guideland use for commercial production.

Sad it would be, however, if after supplying the food needs of city families, the farm family itself should fall short of adequate nutrition. Farm families as well as city families often need more eggs, more butter, more milk, and more of green-colored and leafy vegetables than they now consume. An intelligent approach to the problem includes:

1. Drawing up a suitable food plan on a year-round basis.
2. Deciding on the basis of needs and resources (cash income, land, labor, and management) what share to produce for family consumption and what share to buy.
3. Having reached a decision, distributing the work and responsibility among the family members according to ability to carry the burden.

The aim must be to promote the highest general welfare for the whole family.